

REMARKS

Applicants request the Examiner to reconsider the application in light of the amendments and following remarks. Claims 1-32 are pending. Claims 2, 12 and 24 have been cancelled. Claims 1, 3, 10, 11, 13, 20, 22, 23, 25 and 32 have been amended. No new matter has been added.

Claims 3, 13, and 25 were amended to provide proper unit designation for oxygen permeability. Applicants now believe that the proper units for oxygen permeability are " $(\text{cm}^3 \text{ cm/cm}^2 \cdot \text{s} \cdot \text{Pa}) 10^{-13}$."¹ The Examiner generally objected to claims 3, 13, and 25 that include the phrase "not greater than about..." on grounds this phrase may be indefinite. Applicants traverse this objection as to the claims as amended. Relative terminology, such as the term "about," is acceptable in patent claims. See MPEP 2173.05(b). This is particularly true where, as here, one skilled in the art would understand what is claimed, in light of the specification. Now that the proper oxygen permeability unit has been inserted into these claims, they are sufficiently definite under 35 U.S.C. §112.

Claims 10, 20, 22 and 32 have been amended to correct various typographical errors.

The specification also has been amended to address the various informalities pointed out by the Examiner.

Rejections under § 112

Claims 10 and 20 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement because the term "kaolin clay extender" was not

¹ Attached as Exhibit A is a six page article to PADUA et al which discloses similar units for oxygen permeability at the top of page 3.

disclosed in the specification.² Applicants obviate the rejection by deleting the term "kaolin clay extender" from claims 10 and 20. The terms "kaolin" and "extender" were merely descriptive of the term "clay." By deleting the term "kaolin clay extender" from claims 10 and 20, which depend either directly or indirectly from claims 1 and 11, Applicants have effectively broadened claims 10 and 20 to include additional clays other than kaolin-type clays.

Rejections under § 102

Claims 1, 5, 8 and 9

Claims 1, 5, 8 and 9 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 6,203,450 (Bradley). Applicants respectfully traverse the rejection as to all pending claims.

The Examiner cites Bradley as teaching a golf ball comprising a solid core made of millable polyurethane blended with polybutadiene. As amended, claim 1 is directed to alloy compositions containing polyurethane and rubber that further comprise clay in an amount up to about 50 wt%. Because Bradley does not disclose or claim a composition containing clay, claim 1 distinguishes from Bradley. Claim 1 and all claims depending from claim 1 should be allowed.

Rejections under § 103

Claim 4

The Examiner rejects claim 4 under 35 U.S.C. § 103(a) for allegedly being unpatentable over Bradley et al (6,203,450), in view of Calabria et al (US 2002/0098914). Applicants respectfully traverse this rejection and request reconsideration.

² The term extender is commonly used interchangeably with words such as "additive" or "filler" in describing the use of clays such as kaolin clay in various products. For the record we enclose a definition for kaolin (attached as Exhibit B) stating that kaolin is "a fine usually white clay that is used in ceramics and refractories, as a filler or extender..." *emphasis added*.

Distinctions Between Claim 4 and the Cited References

Applicants respectfully submit that no *prima facie* case of obviousness has been established with regard to claim 4. Claim 4 depends from claim 1. Claim 1 has been amended to include an amount of clay. The references cited by the Examiner to establish obviousness do not teach, suggest or provide any motivation, individually or in combination, to arrive at articles of manufacture made of polyurethane and rubber alloys containing clay. No *prima facie* case of obviousness has been established.

Claims 1-3

The Examiner rejects claims 1-3 under 35 U.S.C. §103(a) for allegedly being unpatentable over U.S. Patent 6,203,450 (Barbee). Applicants respectfully traverse this rejection and request reconsideration.

Distinctions Between Claims 1-3 and the Cited References

Barbee discloses an enormous number of compositions, but none of these are a composition containing polyurethane alloyed with rubber admixed with clay. Barbee does not render claim 1 obvious because Barbee fails to provide any motivation to modify the compositions disclosed in Barbee so as to arrive at the composition claimed in Claim 1. As already noted by the Examiner, Barbee does not teach all elements of claim 1. However, the Examiner alleges that from Barbee "it would have been obvious to one of ordinary skill in the art to utilize a gas-permeation barrier composition comprising a polyurethane and rubber as disclosed by Barbee et al where the oxygen permeability is decreased to below the presently claimed value." This hindsight analysis, however, does not establish a *prima facie* case, as motivation to modify must be found in the prior art. See *In re Geiger*, 2 USPQ.2d 1276 (Fed. Cir. 1987)(MPEP 2144.06). Barbee makes no suggestion to modify as the Examiner proposes.

Furthermore, the Examiner has provided no evidence as to why one skilled in the art would be motivated to attempt to modify Barbee. The question is not whether Barbee is capable of including the claimed invention, but rather if there is some motivation, provided in the prior art, to modify the reference in such a manner as to obtain the invention of the present claims. It is respectfully submitted that there is no such motivation.

Barbee does not provide a reasonable expectation of success. Any reasonable expectation of success must be found in the prior art, not in the Applicants' disclosure. *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991). There is no indication in Barbee that would lead one to conclude that there was a reasonable expectation of successfully translating Barbee into a composition of matter suitable for forming gas-permeation barrier articles comprising polyurethane alloyed with rubber and admixed with clay. The success of the combination could not be established until the Applicants reduced this combination to practice. The unpredictable nature of polymer and rubber alloy combinations with clay weighs heavily in favor of non-obviousness. One skilled in the art has no way of knowing what combination of compounds will have the desired properties. One cannot, therefore, simply provide a laundry list of known polymers and clays and expect the desired gas-permeation properties. Barbee's list of sixteen (16) different polymers (including polyurethane and olefins) provides no guidance or motivation to combine the polymers specifically selected by the Applicants. *See* Barbee at col. 3, paragraph 39. For these reasons, claim 1 and the claims depending from claim 1 (including claim 4) are not *prima facie* obvious over Barbee.

Barbee does not meet each and every limitation of the present claims. In particular, the Examiner has provided no discussion of how Barbee teaches or suggests the combination of polyurethane with rubber admixed with clay. In fact, Barbee teaches away by encouraging the

use of rigid polymers such as PET, and polyamides that are unsuitable for the gas-permeation barrier articles contemplated by the present claims. See Barbee at paragraph 40.

Without some identifiable suggestion or teaching of the claimed combination in Barbee, there can be no expectation of success in a field currently as unpredictable as polymer-clay compositions. Thus, claim 1 and all claims depending from claim 1 distinguish over Barbee and should be allowed.

Claim 10

The Examiner rejects claim 10 under 35 U.S.C. §103(a) for allegedly being unpatentable over Barbee in view of US Patent 4,599,370 (Grossman) and Jablonowski ("Blends of Polyurethane Rubbers with Conventional Rubber," Rubber Division, American Chemical Society, Paper no. 46, April 13-16, 1999). Applicants respectfully traverse this rejection, and request reconsideration.

Distinctions Between Claim 10 and the Cited References

As discussed in detail above, Barbee does not render the present invention, as claimed in claim 1, *prima facie* obvious. Claim 10 depends from claim 1 and therefore incorporates all the limitations of claim 1. Claim 10 patentably distinguishes for the same reasons claim 1 distinguishes.

Grossman and Jablonowski add nothing to Barbee that would lead one skilled in the art to the combination of elements recited in claim 1 or its dependent claim, claim 10. In particular, neither Grossman nor Jablonowski teach or suggest the combinations of polyurethane alloyed with rubber containing clay. Although Grossman and Jablonowski recite a number of polymer additives, neither reference alone or in combination teaches or suggests compositions incorporating the elements of claim 10. The purported combination of Barbee with Grossman

and Jablonowski does not establish a *prima facie* case of obviousness, and therefore the rejection of claim 10 should be withdrawn.

Claims 11-13 and 23-25

The Examiner rejects claims 11-13 and 23-25 under 35 U.S.C. §103(a) for allegedly being unpatentable over Barbee in view of US Patent 6,232,389 (Feeney). Applicants respectfully traverse this rejection and request reconsideration.

The Present Invention (Claims 11-13 and 23-25)

Claims 11 and 13 of the present invention are directed to an inflatable article of manufacture comprising polyurethane, rubber and clay. Claim 12 has been cancelled. The inflatable article of manufacture of claim 13 also comprises an oxygen permeability, at 25°C, not greater than about $(5.5 \text{ cm}^3 \text{ cm/cm}^2 \cdot \text{s} \cdot \text{Pa}) 10^{-13}$. Claims 23 and 25 are directed to tennis balls comprising polyurethane, rubber, and clay. Claim 24 has been cancelled. The tennis balls of claim 25 may also comprise an oxygen permeability, at 25°C, not greater than about $(5.5 \text{ cm}^3 \text{ cm/cm}^2 \cdot \text{s} \cdot \text{Pa}) 10^{-13}$.

Distinctions Between Claims 11-13 and 23-25 and the Cited References

No *prima facie* case of obviousness has been established with regard to the now amended claims 11 and 23 and their dependents. Barbee and Feeney fail to provide any motivation to modify the references individually to try to arrive at the invention recited in each of the present claims. As noted above, Barbee does not teach or suggest a composition combining polyurethane and rubber admixed with clay. Nor does Feeney teach or suggest a polyurethane and rubber alloy. The Examiner cites Feeney as evidence that inflatable articles and tennis balls require the ability to hold air or any other gas under pressure. Applicants do not dispute this contention; however, the Examiner has failed to demonstrate how Barbee or Feeney provides

sufficient motivation to combine polyurethane and rubber admixed with clay to form inflatable articles or tennis balls as claimed in the present application.

There is no motivation in the prior art to combine Barbee with Feeney. Barbee discloses polyurethane and polyolefins, along with an open-ended list of sixteen additional generic polymers. *See* Barbee at col. 3, para. 39. Feeney does not disclose any polyurethane and rubber alloy. Rather, Feeney concerns the use of polyurethane and isoprene or natural rubbers as bladders for inflatable articles. The separate and distinctly different teachings of Barbee and Feeney fail to provide the necessary motivation to prompt one skilled in the art to combine polyurethane and rubber admixed with clay in the manner disclosed and claimed in the present invention. Barbee and Feeney are simply too disparate to motivate a skilled person to modify Barbee to achieve the claimed combination.

The Examiner alleges that the elements of Barbee when combined with Feeney would suggest that it would have been "obvious to one of ordinary skill in the art to use Barbee et al's composition with an inflatable article or tennis ball as taught by Feeney et al and thereby arrive at the presently cited claims." This hindsight analysis, however, does not establish a *prima facie* case, as motivation to modify must be found in the prior art references themselves. The Examiner has provided no objective evidence (divorced from hindsight) as to why one skilled in the art would be motivated to attempt to modify the separate teachings of Barbee and Feeney into the present invention. (MPEP 2143.01). The question is not whether the combination of Barbee and Feeney could be capable of performing the claimed invention, but rather if the reference themselves teach or suggest the claimed inflatable articles and tennis balls. It is respectfully submitted that there is no such teaching or motivation.

The unpredictable nature of polymer-clay chemistry, and in particular its oxygen permeability properties, weighs heavily in favor of non-obviousness. One skilled in the art has no way of knowing what combination of compounds will have the desired properties. One cannot, therefore, simply combine known polymers and additives and expect the desired properties for forming inflatable articles and tennis balls. For these reasons, the present invention is not *prima facie* obvious over Barbee and Feeney in combination or individually.

Claims 11, 13, 23 and 25 distinguish from the cited references and should be allowed.

Claim 32

The Examiner rejects claim 32 under 35 U.S.C. §103(a) for allegedly being unpatentable over Barbee in view of Feeney and further in view of Jablonowski. Applicants respectfully traverse this rejection. Reconsideration and withdrawal of this rejection are requested.

The Present Invention (Claim 32)

Claim 32 depends from claim 23, which is directed to tennis balls comprising polyurethane, rubber and clay. Claim 32 adds additional limitations requiring the composition of the tennis ball to include N330 carbon black, dibutoxyethoxyethyl adipate (DBEEA) plasticizer, zinc stearate accelerator, stearic acid process aid, naphthalenic process oil, benzothiazyl disulfide (MBTS) accelerator, 2-mercaptobenzothiazole (MBT) accelerator, sulfur and tetramethyl thiuram (TMTD)disulfide accelerator.

Distinctions Between Claim 32 and the Cited References

No *prima facie* case of obviousness has been established with regard to claim 32. As discussed in detail above, Barbee fails to render obvious the claimed polyurethane and rubber alloy admixed with clay. Feeney and Jablonowski add nothing to Barbee, but merely establish the existence of the elements recited in claim 32. Neither Feeney nor Jablonowski are capable of

curing the deficiencies of Barbee with respect to the underlying composition of claim 23, *i.e.* an alloy of polyurethane and rubber admixed with clay. A *prima facie* case of obviousness is not established by Barbee in view of Feeney and Jablonowski, and therefore the rejection of claim 32 should be withdrawn.

Claims 1, 5-7, 11, 15-17, 23, and 27-29

The Examiner rejects claims 1, 5-7, 11, 15-17, 23, and 27-29 under 35 U.S.C. §103(a) for allegedly being unpatentable over Feeney in view of Hawley's Chemical Dictionary. Applicants respectfully traverse this rejection and request reconsideration.

Distinctions Between Claims 1, 5-7, 11, 15-17, 23, and 27-29 and the Cited References

No *prima facie* case of obviousness has been established with regard to claims 1, 5-7, 11, 15-17, 23, and 27-29 as amended. The independent claims 1, 11 and 23 have been amended to require polyurethane compositions alloyed with rubber and admixed with clay. The references cited by the Examiner do not teach, suggest or provide any motivation regarding the manufacture of polyurethane and rubber alloys containing clay. The pending claims patentably distinguish from this combination of references.

Claim 20

The Examiner rejects claim 20 under 35 U.S.C. §103(a) for allegedly being unpatentable over Feeney in view of Hawley's Chemical Dictionary and further in view of US Patent 5,593,157 (Koros), Grossman, and Jablonowski. Applicants respectfully traverse this rejection and request reconsideration.

Distinctions Between Claim 20 and the Cited References

No *prima facie* case of obviousness has been established with regard to claim 20. Claim 20 is indirectly dependent on claim 11 which has been amended to include clay within the

composition of the inflatable article of manufacture. The references cited by the Examiner to establish obviousness, individually or in combination, fail to teach, suggest or provide any motivation regarding the manufacture of articles comprising polyurethane and rubber alloys further containing clay. Claim 20 should be allowed.

Claims 18, 19, 30 and 31

The Examiner rejects claims 18, 19, 30 and 31 under 35 U.S.C. §103(a) for allegedly being unpatentable over Feeney in view of Hawley's Chemical Dictionary, and further in view of Bradley. Applicants respectfully traverse this rejection and request reconsideration.

Distinctions Between Claims 18, 19, 30 and 31 and the Cited References

No *prima facie* case of obviousness has been established with regard to claim 18, 19, 30 and 31. Claims 18-19 and claims 30-31 depend from independent claims 11 and 23, respectively. Claims 11 and 23 have been amended to include clay within the composition of the claimed article. As stated above, the cited references do not teach or suggest or provide any motivation, individually or in combination, to arrive at articles of manufacture made of polyurethane and rubber alloys containing clay. Accordingly, claims 11 and 23 and the claims depending from them patentably distinguish and should be allowed.

Claims 4, 14 and 26

The Examiner rejects claims 4, 14 and 26 under 35 U.S.C. §103(a) for allegedly being unpatentable over Feeney in view of Bradley, and further in view of Calabria. Applicants respectfully traverse this rejection and request reconsideration.

Distinctions Between Claims 4, 14 and 26 and the Cited References

No *prima facie* case of obviousness has been established with regard to claims 4, 14 and 26. Claims 4, 14 and 26 depend from independent claims 1, 11 and 23, respectively. Claims 1,

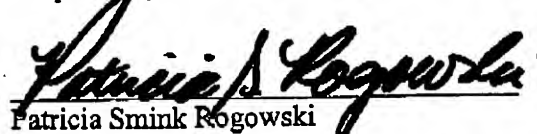
11 and 23 have been amended to include clay within the composition of the claimed article. The cited references do not teach, suggest or provide any motivation, individually or in combination, to arrive at articles of manufacture made of polyurethane and rubber alloys containing clay. Claims 1, 11 and 23 and all claims depending from them distinguish from the prior art and should be allowed.

CONCLUSION

All pending claims should be allowed. Enclosed is a Petition for a one-month extension of time and authorization to debit our deposit account for \$110.00 to cover the required petition fee. No other fees are believed to be due in connection with this amendment. Nevertheless, should the Director determine that any other fee is due before the Examiner may consider this paper, the Director is authorized to charge any deficiency in the fees filed, asserted to be filed, or which should have been filed herewith to our Deposit Account No. 03-2775.

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Respectfully submitted,



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Enclosure
Exhibits A and B
Petition for 1-Mo. Ext.
Fee Transmittal